BIOLOGICAL EVALUATION

Western Spruce Budworm Infestation
Bridger-Teton - Targhee National Forests
1974

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INTRODUCTION

Populations of the western spruce budworm continue to infest portions of the Douglas-fir and true fir stands in the Bridger-Teton and Targhee National Forests. This outbreak began in 1965, reached a relatively high level in 1968, and with minor fluctuations, has been on the decline since. A year-by-year listing of western spruce budworm activity by area and defoliation categories from 1965 to 1974 follows:

Year	Forests[2]	Defoliation Intensity[1] (in acres)			
		Light	Medium	Heavy	Total
1965	BT	10,000	--	--	10,000
1966	BT	33,000	800	--	33,800
1967	BT, Ta	25,800	34,400	1,600	61,800
1968	BT, Ta, C	51,600	68,800	12,400	132,800
1969	BT, Ta, C	79,900	3,200	--	83,100
1970	BT, Ta, C	70,700	10,200	--	80,900
1971	BT, Ta, C	13,600	16,600	10,300	40,500
1972	BT, Ta, C	35,500	29,100	2,000	66,600
1973	BT, Ta, C	--	--	--	--
1974	BT, Ta	18,300	2,100	--	20,400

1/ Determined by aerial reconnaissance.
2/ BT, Bridger-Teton, Ta, Targhee; C, Caribou.

It should be pointed out here that 1974 defoliation is actually more widespread than that mapped during the aerial survey. Premature fall of the damaged needles due to abnormally warm and dry weather during June and early July followed by a late aerial survey prevented accurate delineation of infestation boundaries. Defoliation of Douglas-fir and

and subalpine fir was observed by Forest personnel on parts of the Dubois Ranger District, Targhee National Forest, but we were unable to detect it from the air. There is a good possibility also that defoliation on the Bridger-Teton is more extensive than that mapped.

GENERAL INFORMATION

INSECT: Western spruce budworm, Choristoneura occidentalis Free.

HOST TREES: Douglas-fir, Pseudotsuga menziesii
subalpine fir, Abies lasiocarpa
Engelmann spruce, Picea engelmanni

LOCATION: Grand Canyon of the Snake River and nearby tributaries, Bridger-Teton and Targhee National Forests.

EXTENT OF INFESTATION: Jackson, Wyoming, south to Dead Dog Creek, tributary of the Greys River.

FEATURES OF THE AREA: Major recreation areas such as Jackson, Wyoming, and the Grand Canyon of the Snake River are in or near the infestation area. Defoliation of ornamentals occurred in Jackson and on Snow King Mountain, site of a ski area and scenic backdrop to Jackson. Light and spotty defoliation was visible from the Grand Canyon of the Snake River highway.

BIOLOGICAL INFORMATION

An on-the-ground biological evaluation survey was undertaken during the week of September 16-20. Ten collection points were established in or near known defoliated areas--five in the upper Snake and five in the Greys River drainages (Figure 1). A collection consists of two 30" midcrown branches from opposite quadrants of five co-dominant Douglas-fir. The branches were carefully removed with pole pruners, labeled, placed in individual cloth sacks, and brought to the laboratory in Ogden. Each branch was carefully examined by a trained technician for new and old egg mass remains. The newly hatched egg masses were then separated from the older masses by microscopic examination. The length and number of rows (the number of rows varies from one to four but averages three) for each new egg mass remnant was then recorded.

The number of new egg masses indicates within a reasonable range the degree of defoliation that can be expected next summer. The results of the survey together with damage and trend estimates follow:

Area	Plot Location	No. Egg Masses per Plot 1973	1974	Predicted Defoliation for 1975 Percent	Class	Trend
1	Radio Pk.	NS[1/]	128	56-100	Heavy	--
2	Snow King	NS	87	56-100	Heavy	--
3	Cache Cr.	NS	38	41-55	Medium	--
4	Horse Cr.	NS	68	56-100	Heavy	--
5	Fall Cr.	39	62	56-100	Heavy	Increasing
6	Higby Cr.	6	9	26-40	Light	Static
7	Squaw Cr.	24	10	26-40	Light	Decreasing
8	Roos Cr.	82	69	56-100	Heavy	Static
9	Porcupine	73	149	56-100	Heavy	Increasing
10	Blind Bull	NS	1	0-25	Very light	--

[1/] NS: no sample taken.

Egg mass remains were, on the average, of normal length and complement, and did not exhibit an unusual incidence of non-hatch or parasitism. Survival of the overwintering larvae in the Jackson area will be evaluated sometime next spring.

These data portend an increase in both intensity and extent of defoliation during 1975.

DISCUSSION

Of several known extrinsic factors responsible for budworm population increases (or decreases), weather during the critical larval growth period is one of the most important. Warm, dry and clear weather during the larval stage--in this case June--results in a high feeding rate and rapid development, hence the larval stage is shortened and less exposed to natural enemies. High temperatures and below normal precipitation prevailed during June throughout the outbreak areas. Weather Bureau monthly summaries, for example, listed a 5.1 degree average temperature increase and a 46 percent precipitation decrease for the Snake drainage, Wyoming, and a 5.1 degree temperature increase and a 73 percent moisture decrease for the eastern highlands region, Idaho.

Surveys to measure budworm-caused damage to host stands have been in progress since 1971. Outbreak areas on the Payette, Salmon, and

Bridger-Teton National Forests known to have sustained heavy defoliation were measured to determine tree mortality, top kill and growth pattern changes. Of 17 different areas cruised, two are on the Bridger-Teton in Bailey and Mill Creeks in the Greys River drainage. No mortality or top kill has occurred in these particular areas, but in other areas such as the head of Pine and Roos Creeks, some top kill of the overstory and mortality of the suppressed understory have been observed. Reduced radial increment due to budworm feeding during the period 1965 to 1971 was measured in Squaw, Higby, and Porcupine Creeks (see 1972 evaluation report). On a Regionwide scale, of the 17 areas measured, tree mortality and top kill averaged 2.7 and 11.8 percent respectively. Most of the mortality occurred in the small, suppressed understory. Decreases in radial growth also occurred during the infestation, but resurged following cessation of budworm feeding.

Suppression of the western spruce budworm over large, forested areas can only be accomplished by aerial spraying. There is no approved method or registered insecticide for ground application.

RECOMMENDATION

Control is not recommended.

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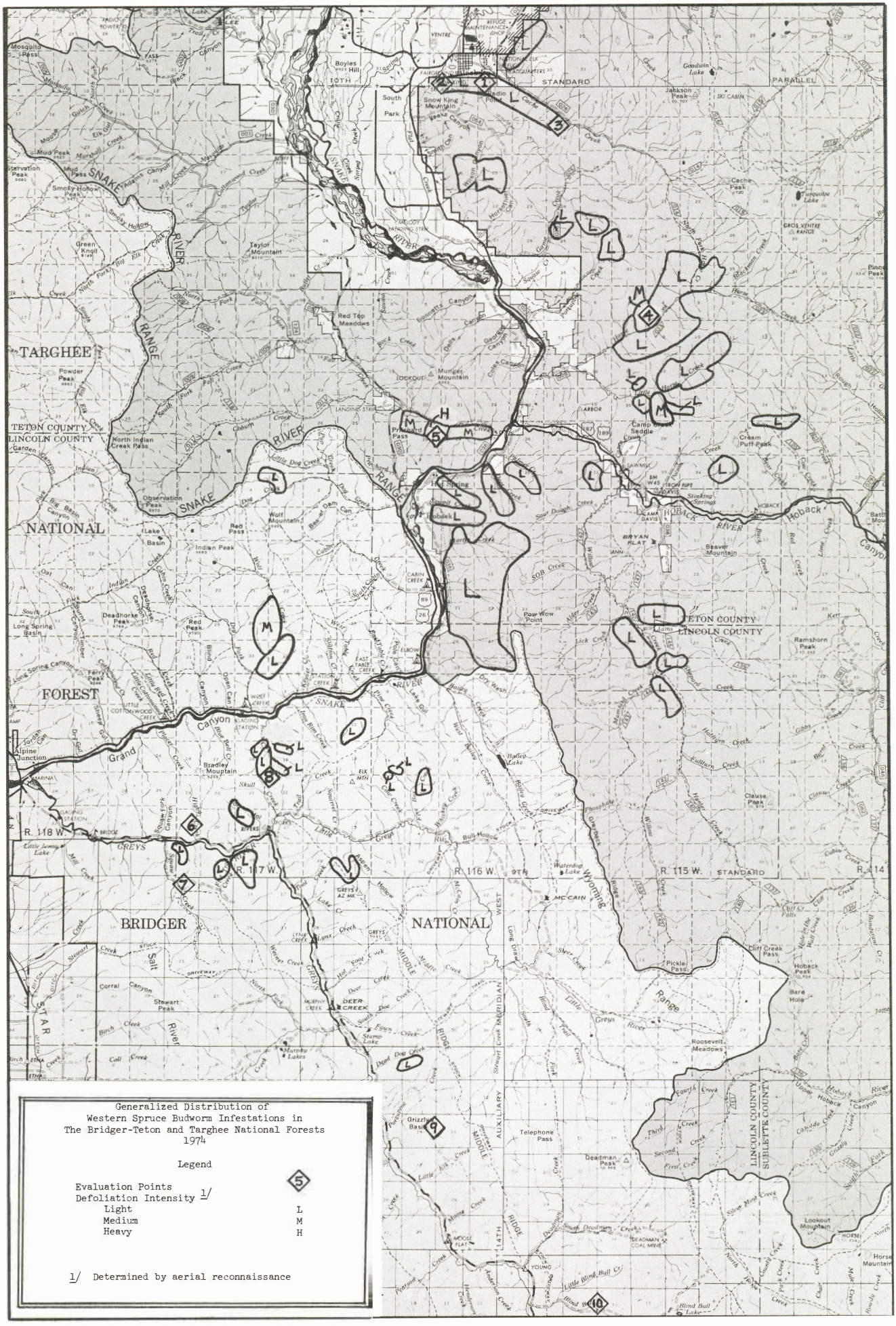
TARGHEE
NATIONAL
FOREST
BRIDGER
NATIONAL
FOREST
TETON COUNTY
LINCOLN COUNTY
TETON COUNTY
LINCOLN COUNTY
SUBLETTE COUNTY
SNAKE RIVER RANGE
Teton Range
Hoback Canyon
Grand Canyon
Alpine Junction
Jackson Lake
Snow King Mountain
Boyles Hill
Taylor Mountain
Green Knoll
Red Top Meadows
Munger Mountain
Powder Peak
Observation Peak
Red Pass
Wolf Mountain
Lake Basin
Indian Peak
Deadhorse Peak
Ferry Peak
Bradley Mountain
Stewart Peak
Cache Peak
Cream Puff Peak
Beaver Mountain
Paw Wow Point
Ramshorn Peak
Clevise Peak
Pickle Pass
Bare Hole
Roosevelt Meadows
Deadman Peak
Telephone Pass
Lookout Mountain
Grizzly Basin
Bryan Flat
Hot Springs
Canyon Saddle
Prospect Pass
North Indian Creek Pass
Mosquito Pass
Mud Pass
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Mosquito Pass
Mud Pass
Smoky Hollow Peak
Starvation Peak
R. 118 W.
R. 117 W.
R. 116 W.
R. 115 W.
R. 114
STANDARD PARALLEL
WYOMING
MERIDIAN
RIDGE
14TH
AUXILIARY
WEST
MIDDLE
GREEN
SALT
STAR
GREYS
HOBACK
RIVER
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